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EXAMINER	
HOPKINS, ROBERT A	

ART UNIT	PAPER NUMBER
1724	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/788,755	MEEGAN, GEORGE DOUGLAS	
	Examiner	Art Unit	
	Robert A. Hopkins	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,9,12-14,21,23,26-29,31,32,36,43-46,48,50-52,54,56-62,64,66-72,75,76 and 79* is/are rejected.

7)☒ Claim(s) *7,10,11,15-20,22,24,25,30,33-35,37-42,47,49,53,55,63,65,73,74,77,78 and 80-82* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6,8,9,12-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Benes et al(5225089).

Benes et al teaches an acoustic agglomerator for agglomerating constituents comprising an acoustic generator configured to communicate with an area containing a fluid having constituents(figure 14, dispersion A), wherein the acoustic generator is operable to generate a frequency modulated acoustic field without reliance on the fluid(column 18 lines 39-50), wherein the frequency modulated acoustic field is applied to the fluid to enhance agglomeration of the constituents in the fluid(column 19 lines 27-28). Benes et al further teaches wherein the fluid is further defined as a liquid(column 1 lines 17-23). Benes et al further teaches wherein the fluid is further defined as a gas. Benes et al further teaches wherein the fluid is further defined as a combustion exhaust gas. Benes et al further teaches a second acoustic generator(6; column 15 line 63) operable to generate a second acoustic field without reliance on the fluid(figure 1), wherein the second acoustic field is applied to the fluid to enhance agglomeration of the constituents in the fluid. Benes et al further teaches wherein the second acoustic field is modulated. Benes et al further teaches wherein the second

acoustic field is frequency modulated. Benes et al further teaches wherein the acoustic generator frequency modulates the acoustic field relative to a first frequency and the second acoustic generator frequency modulates the second acoustic field relative to a second frequency. Benes et al further teaches a plurality of acoustic generators(6) operable to generate a plurality of modulated acoustic fields without reliance on the fluid, wherein the plurality of modulated acoustic fields are applied to the fluid to enhance agglomeration of the constituents in the fluid. Benes et al further teaches a plurality of acoustic generators(6) operable to generate a uniform(stepwise increase in resonant frequency) modulated acoustic field without reliance on the fluid along the length of an exhaust duct, wherein the plurality of modulated acoustic fields are applied to the fluid to enhance agglomeration of the constituents in the fluid. Benes et al further teaches a particle collection device(outlets 26,26' in figure 14) to receive the fluid from the area, the particle collection device operable to remove at least a portion of the constituents from the fluid.

Claims 21,23,26-29,31,32,36 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Benes et al(5225089).

Benes et al teaches an acoustic agglomerator for agglomerating constituents comprising an acoustic generator(5) configured to communicate with an area containing a gas(liquid particles(fog) in gases; column 1 lines 23-24) having constituents, wherein the acoustic generator is operable to generate a modulated acoustic field without reliance on the gas, wherein the modulated acoustic field is applied to the gas to enhance agglomeration of the constituents in the gas fluid(column 19 lines 27-28).

Benes et al further teaches wherein the acoustic generator can generate a frequency modulated acoustic field. Benes et al further teaches a second acoustic generator(6; column 15 line 63) operable to generate a second acoustic field without reliance on the gas(figure 1), wherein the second acoustic field is applied to the gas to enhance agglomeration of the constituents in the gas. Benes et al further teaches a plurality of acoustic generators(6) operable to generate a plurality of modulated acoustic fields without reliance on the gas, wherein the plurality of modulated acoustic fields are applied to the gas to enhance agglomeration of the constituents in the gas. Benes et al further teaches wherein at least a first acoustic generator of the plurality of acoustic generators can generate a frequency modulated acoustic field. Benes et al further teaches wherein the acoustic generator frequency modulates the acoustic field relative to a first frequency and the second acoustic generator frequency modulates the second acoustic field relative to a second frequency. Benes et al further teaches a particle collection device(outlets 26,26' in figure 14) to receive the fluid from the area, the particle collection device operable to remove at least a portion of the constituents from the fluid.

Claims 43-46,48,50, and 51 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Benes et al(5225089).

Benes et al teaches an acoustic agglomerator for agglomerating constituents comprising an acoustic generator(5) configured to communicate with an area containing a fluid having constituents(figure 14; dispersion A), wherein the fluid is in an open area, wherein the acoustic generator is operable to generate a modulated acoustic field

without reliance on the fluid(column 18 lines 39-50), wherein the modulated acoustic field is applied to the fluid to enhance agglomeration of the constituents in the fluid(column 19 lines 27-28). Benes et al further teaches wherein the acoustic generator can modulate the frequency of the acoustic field.

Claims 52,54, and 56-58 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Benes et al(5225089).

Benes et al teaches an acoustic agglomerator for agglomerating constituents comprising an acoustic generator(5) configured to communicate with an exhaust of a vehicle having constituents(figure 14, dispersion A), wherein the acoustic generator is operable to generate a modulated acoustic field without reliance on the exhaust(column 18 lines 39-50), wherein the modulated acoustic field is applied to the fluid to enhance agglomeration of the constituents in the fluid(column 19 lines 27-28). Benes et al further teaches wherein the acoustic generator can modulate the frequency of the acoustic field.

Claims 59-62,64 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Benes et al(5225089).

Benes et al teaches an acoustic agglomerator for agglomerating constituents comprising an acoustic generator(5) configured to communicate with an area with a fluid flow having constituents(figure 14; dispersion A), wherein the acoustic generator is operable to generate a modulated acoustic field without reliance on the fluid(column 18 lines 39-50), wherein the modulated acoustic field is applied to the fluid to enhance agglomeration of the constituents in the fluid(column 19 lines 27-28), and the acoustic

generator applies the modulated acoustic field at an angle arbitrary to a direction of the fluid flow. Benes et al further teaches wherein the acoustic generator can modulate the frequency of the acoustic field.

Claims 66-72,75,76,79 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Benes et a1(5225089).

Benes et al teaches an acoustic agglomerator for agglomerating constituents comprising an acoustic generator(5) configured to communicate with an area with a fluid flow having constituents(figure 14, dispersion A), wherein the acoustic generator is operable to generate a modulated acoustic field without reliance on the fluid(column 18 lines 39-50), wherein the modulated acoustic field is applied to the fluid to enhance agglomeration of the constituents in the area(column 19 lines 27-28), and a system operable to determine information about the constituents in the area, wherein the acoustic generator can modify the modulated acoustic field in response to the information(column 5 lines 26-50,column 6 lines 1-8). Benes et al further teaches wherein the system includes an opacity detector(magnifying glass or microscope). Benes et al further teaches wherein the system includes a particulate analyzer. Benes et al further teaches wherein the modification to the acoustic field is a modification to the frequency of the acoustic field. Benes et al further teaches wherein the modification to the acoustic field is a modulation of the acoustic field. Benes et al further teaches wherein the modulation is a frequency modulation.

Allowable Subject Matter

Claims 7,10,11,15-20,22,24,25,30,33-35,37-42,47,49,53,55,63,65,73,74,77,78,80,81, and 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 recites "wherein the second acoustic field is amplitude modulated". Benes et al teaches a second acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a second acoustic field which is amplitude modulated because Benes et al does not suggest such a modification.

Claim 10 recites "wherein the acoustic generator amplitude modulates the acoustic field, and the second acoustic generator amplitude modulates the second acoustic field". Benes et al teaches an acoustic field and a second acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field and a second acoustic field which is amplitude modulated because Benes et al does not suggest such a modification.

Claims 15-19 recite wherein the particle collection device is a filter, electrostatic precipitator, baghouse, cyclone separator, and gravitational settling chamber respectively. Benes et al teaches a particle collection device, but does not teach wherein the particle collection device is a filter, electrostatic precipitator, baghouse, cyclone separator, and gravitational settling chamber respectively. It would not have

been obvious to someone of ordinary skill in the art at the time of the invention to provide wherein the particle collection device is a filter, electrostatic precipitator, baghouse, cyclone separator, and gravitational settling chamber respectively because Benes et al does not suggest such a modification.

Claim 20 recites "a hopper operably positioned to accumulate at least a portion of the constituents removed from the fluid by the particle collection device. Benes et al teaches a particle collection device, but does not teach a hopper operably positioned to accumulate at least a portion of the constituents removed from the fluid by the particle collection device. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a hopper operably positioned to accumulate at least a portion of the constituents removed from the fluid by the particle collection device because Benes et al does not suggest such a modification.

Claim 22 recites "wherein the acoustic generator can generate an amplitude modulated acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field which is amplitude modulated because Benes et al does not suggest such a modification. Claims 24,25 depend on claim 22 and hence would also be allowable upon incorporation of claim 22 into claim 21 .

Claim 30 recites "wherein at least a first acoustic generator of the plurality of acoustic generators can generate an amplitude modulated acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide at

least a first acoustic generator of the plurality of acoustic generators can generate an amplitude modulated acoustic field because Benes et al does not suggest such a modification

Claim 33 recites "wherein at least a first acoustic generator can generate an amplitude modulated acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide at least a first acoustic generator which can generate an amplitude modulated acoustic field because Benes et al does not suggest such a modification. Claim 34 depends on claim 33 and hence would also be allowable upon incorporation of claims 33,32, 31, and 28 into claim 21.

Claims 37-41 recite wherein the particle collection device is a filter, electrostatic precipitator, baghouse, cyclone separator, and gravitational settling chamber respectively. Benes et al teaches a particle collection device, but does not teach wherein the particle collection device is a filter, electrostatic precipitator, baghouse, cyclone separator, and gravitational settling chamber respectively. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide wherein the particle collection device is a filter, electrostatic precipitator, baghouse, cyclone separator, and gravitational settling chamber respectively because Benes et al does not suggest such a modification.

Claim 42 recites "a hopper operably positioned to accumulate at least a portion of the constituents removed from the fluid by the particle collection device". Benes et al teaches a particle collection device, but does not teach a hopper operably positioned

to accumulate at least a portion of the constituents removed from the fluid by the particle collection device. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a hopper operably positioned to accumulate at least a portion of the constituents removed from the fluid by the particle collection device because Benes et al does not suggest such a modification.

Claim 47 recites "wherein the acoustic generator can modulate the amplitude of the acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field which is amplitude modulated because Benes et al does not suggest such a modification.

Claim 49 recites "wherein the acoustic generator can modulate the frequency and amplitude of the acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic generator which can modulate the frequency and amplitude of the acoustic field because Benes et al does not suggest such a modification.

Claim 53 recites "wherein the acoustic generator can modulate the amplitude of the acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field which is amplitude modulated because Benes et al does not suggest such a modification.

Claim 55 recites "wherein the acoustic generator can modulate the frequency

and amplitude of the acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the ad at the time of the invention to provide an acoustic generator which can modulate the frequency and amplitude of the acoustic field because Benes et al does not suggest such a modification.

Claim 63 recites "wherein the acoustic generator can modulate the amplitude of the acoustic field. Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field which is amplitude modulated because Benes et al does not suggest such a modification.

Claim 65 recites "wherein the acoustic generator can modulate the frequency and amplitude of the acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic generator which can modulate the frequency and amplitude of the acoustic field because Benes et al does not suggest such a modification.

Claim 73 recites "wherein the modulation is an amplitude modulation". Benes et al teaches wherein the modulation is a frequency modulation. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a modulation which is an amplitude modulation because Benes et al does not suggest such a modification.

Claim 74 recites "wherein the modulation is a combination of frequency and amplitude modulation". Benes et al teaches wherein the modulation is a frequency modulation. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a modulation which is a frequency and amplitude modulation because Benes et al does not suggest such a modification.

Claim 77 recites "wherein the acoustic field is amplitude modulated". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field which is amplitude modulated because Benes et al does not suggest such a modification.

Claim 78 recites "wherein the acoustic field is frequency and amplitude modulated". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an acoustic field which is frequency and amplitude modulated because Benes et al does not suggest such a modification. Claims 80 and 81 depend on claim 78 and hence would also be allowable upon incorporation of claims 78,75 into claim 66.

Claim 82 recites "wherein the modification to the acoustic field is a modification to the amplitude of the acoustic field". Benes et al teaches an acoustic field which is frequency modulated. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide an modification to the acoustic field which is a

modification to the amplitude of the acoustic field because Benes et al does not suggest such a modification.

Claims 83-88 are allowed.

Claim 83 recites "providing a filtration device operable to filter a fluid stream having constituents; generating a modulated acoustic field without reliance on the fluid stream; applying the modulated acoustic field to the fluid stream at a point upstream of the filtration device, wherein the modulated acoustic field enhances an agglomeration of the constituents". Benes et al teaches generating a modulated acoustic field without reliance on the fluid stream, but does not teach applying the modulated acoustic field to the fluid stream at a point upstream of a filtration device, wherein the modulated acoustic field enhances an agglomeration of the constituents. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a step of applying the modulated acoustic field to the fluid stream at a point upstream of a filtration device because Benes et al does not suggest such a modification. Claims 84-88 depend on claim 83 and hence are also allowed.

Response to Arguments

Applicant's arguments filed 2-21-06 have been fully considered but they are not persuasive.

Applicant argues Benes et al fails to teach, or even suggest, agglomerating constituents in a fluid or in any other manner. Applicant further argues that, in contrast, Benes et al teaches separating particles, which is obviously different than

agglomerating, or combining particles, as claimed. Applicant further argues Benes et al teaches away from the claimed invention as set forth in claim 1.

Examiner notes column 7 lines 20-25 of Benes et al under the heading "DESCRIPTION OF THE INVENTION" which recites "By choosing such an amplitude of the sound particle velocity arising in the sound field and by precise tuning of the excitation frequency to the resonant frequency of the composite resonator, one achieves a particularly good coagulation of particles. Examiner also notes column 9 lines 20-30 which recites "The dispersion medium flows through the vessel essentially in a direction which is normal to the longitudinal direction, thus enabling the holding and coagulation of particles in the areas of the nodes and antinodes. In the case of high concentration of particles or low flow rates , it is preferable to periodically interrupt the electrical excitation of the resonance for such a period until the particles coagulated in the areas of the nodes and antinodes have been precipitated by means of gravity". Examiner respectfully submits that the above passages from Benes et al clearly teach that the acoustic generator of Benes et al provides for a coagulation of the constituents within a fluid. Examiner notes from Websters Collegiate Dictionary, Tenth Edition, that the definition of coagulate is "to gather together or form into a mass or group", and the definition of agglomerate is "to gather into a ball, mass, or cluster". Therefore, examiner respectfully submits that the above passages from Benes et al clearly teach that the acoustic generator of Benes et al provides for an agglomeration of the constituents within a fluid.

Examiner also notes that the passage stating that the electrical excitation of the resonance is periodically interrupted teaches that after the coagulation(agglomeration) of the particles, the particles are separated from the fluid by precipitation by means of gravity. Examiner notes the current application also provides for separation of agglomerated particles by use of a conventional filtration device. However, examiner respectfully submits that the separation step occurs subsequent to a coagulation(agglomeration) of the particles. Examiner notes that Benes et al discusses a fluid flow containing "strongly varying sizes of particles(column 6 lines 1-2), and precipitation by means of gravity would not be able to effectively occur if the agglomeration of the particles did not previously occur. Examiner notes that especially for separation of liquid particles(fog) in gases(column 1 lines 22-23), since Benes et al does not mention a conventional structure for "separating" particles, the diameter of the fog particles is so small, that without some sort of agglomeration of the fog particles, a separation of the particles from a gas would not occur.

Examiner furthermore notes that, as recited in column 18 lines 23-47, the agglomeration occurs by a frequency modulated acoustic field, wherein over a period T, the frequency is increased in a stepwise manner. Examiner notes page 17 lines 8-10 of the current specification which recites "By changing the frequency as a function of time(frequency modulation) the nodal position is shifted which further promotes agglomeration of the particulate matter". Clearly Benes et al teaches changing the frequency as a function of time, and hence teaches frequency modulation.

Examiner notes that since the same arguments were applied to claims 21,43,52,59, and 66, the above response is not presented individually for each of the claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A. Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Friday, 7am-4pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rah
March 25, 2006

ROBERT A. HOPKINS
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